

SEQUENCE LISTING

<110> Japan Science and Technology Corporation
manager of Natinal Insutitute of Infectious Diseases

<120> Medicine for promoting ceramide transportation, sequence for
manufacturing the medicine, method for measuring the promoting act
ivity for ceramide isolation, and method for measuring the promotin
g activity for ceramide migration between membranes

<130> P000

<160> 32

<170> PatentIn version 3.1

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<211> 598

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Trp Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys
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Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
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Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
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Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
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Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile

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Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser
 340 345 350

Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val
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Gln Lys Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
 370 375 380

Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
 385 390 395 400

Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
 405 410 415

Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
 420 425 430

Cys Asn Tyr Phe Trp Asn Val Asp Val Arg Asn Asp Trp Glu Thr Thr
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Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
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Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
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Leu Tyr Leu Ser Val Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp

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490

495

Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
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Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
 515 520 525

Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
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Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
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Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
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Gly Lys Pro Ile Leu Phe
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 35 40 45

Asn Asn Ala Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
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Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
65 70 75 80

Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
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Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile
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Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg
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Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser
130 135 140

Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys
145 150 155 160

Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp
165 170 175

Thr Leu Gln Lys Tyr Phe Asp Ala Cys Ala Asp Ala Val Ser Lys Asp
180 185 190

Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro
195 200 205

Thr Thr Arg Ser Asp Gly Asp Phe Leu His Ser Thr Asn Gly Asn Lys
210 215 220

Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp
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Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu
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Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Asp Ser
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Trp Gln Lys Arg Leu Asp Lys Glu Thr Glu Lys Lys Arg Arg Thr Glu
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Glu Ala Tyr Lys Asn Ala Met Thr Glu Leu Lys Lys Lys Ser His Phe
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Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu
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Glu Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile
325 330 335

Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Ser
340 345 350

Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val
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Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val
370 375 380

Ser Ala Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met
385 390 395 400

Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala
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Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg
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Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His
435 440 445

Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Asn
450 455 460

Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val
465 470 475 480

Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys
485 490 495

Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Val Ile
500 505 510

Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val
515 520 525

Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys
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Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser
545 550 555 560

Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys
565 570 575

Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser
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Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg
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Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala Gly Lys Pro Ile Leu Phe
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Trp Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys
 35 40 45

Asn Asn Thr Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
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Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
 65 70 75 80

Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
 85 90 95

Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile
 100 105 110

Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg
 115 120 125

Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser
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Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys
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Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp
165 170 175

Thr Leu Gln Lys Tyr Phe Asp Val Cys Ala Asp Ala Val Ser Lys Asp
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Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro
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Thr Thr Arg Ser Asp Gly Asp Phe Leu His Asn Thr Asn Gly Asn Lys
210 215 220

Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp
225 230 235 240

Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu
245 250 255

Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Glu Ser
260 265 270

Trp Gln Lys Arg His Asp Lys Glu Met Glu Lys Arg Arg Arg Leu Glu
275 280 285

Glu Ala Tyr Lys Asn Ala Met Ala Glu Leu Lys Lys Lys Pro Arg Phe
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Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu
305 310 315 320

Glu Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile
325 330 335

Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Pro
340 345 350

Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val
355 360 365

Gln Lys Val Glu Glu Met Val Gln Asn His Met Thr Tyr Ser Leu Gln
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Asp Val Gly Gly Asp Ala Asn Trp Gln Leu Val Val Glu Glu Gly Glu
385 390 395 400

Met Lys Val Tyr Arg Arg Glu Val Glu Glu Asn Gly Ile Val Leu Asp
405 410 415

Pro Leu Lys Ala Thr His Ala Val Lys Gly Val Thr Gly His Glu Val
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Cys Asn Tyr Phe Trp Ser Val Asp Val Arg Asn Asp Trp Glu Thr Thr
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Ile Glu Asn Phe His Val Val Glu Thr Leu Ala Asp Asn Ala Ile Ile
450 455 460

Ile Tyr Gln Thr His Lys Arg Val Trp Pro Ala Ser Gln Arg Asp Val
465 470 475 480

Leu Tyr Leu Ser Ala Ile Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp
485 490 495

Pro Glu Thr Trp Ile Val Cys Asn Phe Ser Val Asp His Asp Ser Ala
500 505 510

Pro Leu Asn Asn Arg Cys Val Arg Ala Lys Ile Asn Val Ala Met Ile
515 520 525

Cys Gln Thr Leu Val Ser Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg
530 535 540

Asp Asn Ile Leu Cys Lys Ile Thr Tyr Val Ala Asn Val Asn Pro Gly
545 550 555 560

Gly Trp Ala Pro Ala Ser Val Leu Arg Ala Val Ala Lys Arg Glu Tyr
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Pro Lys Phe Leu Lys Arg Phe Thr Ser Tyr Val Gln Glu Lys Thr Ala
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Gly Lys Pro Ile Leu Phe
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Trp Thr Asn Tyr Ile His Gly Trp Gln Asp Arg Trp Val Val Leu Lys
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Asn Asn Thr Leu Ser Tyr Tyr Lys Ser Glu Asp Glu Thr Glu Tyr Gly
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Cys Arg Gly Ser Ile Cys Leu Ser Lys Ala Val Ile Thr Pro His Asp
65 70 75 80

Phe Asp Glu Cys Arg Phe Asp Ile Ser Val Asn Asp Ser Val Trp Tyr
85 90 95

Leu Arg Ala Gln Asp Pro Asp His Arg Gln Gln Trp Ile Asp Ala Ile
100 105 110

Glu Gln His Lys Thr Glu Ser Gly Tyr Gly Ser Glu Ser Ser Leu Arg
115 120 125

Arg His Gly Ser Met Val Ser Leu Val Ser Gly Ala Ser Gly Tyr Ser
130 135 140

Ala Thr Ser Thr Ser Ser Phe Lys Lys Gly His Ser Leu Arg Glu Lys
145 150 155 160

Leu Ala Glu Met Glu Thr Phe Arg Asp Ile Leu Cys Arg Gln Val Asp
165 170 175

Thr Leu Gln Lys Tyr Phe Asp Val Cys Ala Asp Ala Val Ser Lys Asp
180 185 190

Glu Leu Gln Arg Asp Lys Val Val Glu Asp Asp Glu Asp Asp Phe Pro
195 200 205

Thr Thr Arg Ser Asp Gly Asp Phe Leu His Asn Thr Asn Gly Asn Lys
210 215 220

Glu Lys Leu Phe Pro His Val Thr Pro Lys Gly Ile Asn Gly Ile Asp
225 230 235 240

Phe Lys Gly Glu Ala Ile Thr Phe Lys Ala Thr Thr Ala Gly Ile Leu
245 250 255

Ala Thr Leu Ser His Cys Ile Glu Leu Met Val Lys Arg Glu Glu Ser
260 265 270

Trp Gln Lys Arg His Asp Lys Glu Met Glu Lys Arg Arg Arg Leu Glu
275 280 285

Glu Ala Tyr Lys Asn Ala Met Ala Glu Leu Lys Lys Lys Pro Arg Phe
290 295 300

Gly Gly Pro Asp Tyr Glu Glu Gly Pro Asn Ser Leu Ile Asn Glu Glu
305 310 315 320

Glu Phe Phe Asp Ala Val Glu Ala Ala Leu Asp Arg Gln Asp Lys Ile
325 330 335

Glu Glu Gln Ser Gln Ser Glu Lys Val Arg Leu His Trp Pro Thr Pro
340 345 350

Leu Pro Ser Gly Asp Ala Phe Ser Ser Val Gly Thr His Arg Phe Val
355 360 365

Gln Lys Pro Tyr Ser Arg Ser Ser Ser Met Ser Ser Ile Asp Leu Val
370 375 380

Ser Ala Ser Asp Asp Val His Arg Phe Ser Ser Gln Val Glu Glu Met
385 390 395 400

Val Gln Asn His Met Thr Tyr Ser Leu Gln Asp Val Gly Gly Asp Ala
405 410 415

Asn Trp Gln Leu Val Val Glu Glu Gly Glu Met Lys Val Tyr Arg Arg
420 425 430

Glu Val Glu Glu Asn Gly Ile Val Leu Asp Pro Leu Lys Ala Thr His
435 440 445

Ala Val Lys Gly Val Thr Gly His Glu Val Cys Asn Tyr Phe Trp Ser
450 455 460

Val Asp Val Arg Asn Asp Trp Glu Thr Thr Ile Glu Asn Phe His Val
465 470 475 480

Val Glu Thr Leu Ala Asp Asn Ala Ile Ile Ile Tyr Gln Thr His Lys
485 490 495

Arg Val Trp Pro Ala Ser Gln Arg Asp Val Leu Tyr Leu Ser Ala Ile
500 505 510

Arg Lys Ile Pro Ala Leu Thr Glu Asn Asp Pro Glu Thr Trp Ile Val
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Cys Asn Phe Ser Val Asp His Asp Ser Ala Pro Leu Asn Asn Arg Cys
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Val Arg Ala Lys Ile Asn Val Ala Met Ile Cys Gln Thr Leu Val Ser
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Pro Pro Glu Gly Asn Gln Glu Ile Ser Arg Asp Asn Ile Leu Cys Lys
565 570 575

Ile Thr Tyr Val Ala Asn Val Asn Pro Gly Gly Trp Ala Pro Ala Ser
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Val Leu Arg Ala Val Ala Lys Arg Glu Tyr Pro Lys Phe Leu Lys Arg
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ctttgaaagc taccatgca gttaaagggtg ttacaggaca cgaagtctgc aattactttt
1740

ggagtgttga tgttcgcaat gactgggaaa ctactataga aaacttccat gtagtgga
1800

cattagctga taatgcaatc atcatttate aaacgcacaa gagagtgtgg cctgcttctc
1860

agagagatgt actgtatctt tctgctatc gaaagatccc agccttgact gagaacgacc

1920

ctgagacttg gatagtttgt aatttttctg tggatcatga cagcgctcct ctgaacaatc
1980

gatgtgtccg tgccaaaate aatgttgcta tgatttgtca aaccttagta agcccaccag
2040

agggaaacca ggaaataagc agagacaaca ttctgtgcaa gattacatat gtagctaattg
2100

tgaacccagg aggatgggca ccagcctcgg tgtaagagc agtggcaaaa cgagaatatc
2160

ctaaatttct aaaacgtttt acttcttacg tccaagaaaa aactgcagga aaaccaattt
2220

tgtttttagta tgtacagtga ctgaagcaag gctgtgtgac attccatgtt ggagaaagaa
2280

agaagaaaaa ttgagttctc taagctggaa cataggatct acagccttgt ccatggccca
2340

agaagaatca ttgcaatagt aaagctgggt atctaact agccatctcc tgatagatct
2400

ccttgctcaa tgtgtaacta taaatacatg taaaatcaca tgcaaaaaaa aaaaaaaaaa
2460

aaaaaaaaaa aaa
2473

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<211> 1872
<212> DNA
<213> CHO-K1

<400> 8
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120

caggatcgtt gggtagtttt gaaaaataat actttgagtt actacaaatc tgaagatgag
180

acagagtacg gttgcagggg atccatctgt cttagcaagg ctgtgatcac acctcatgat
240

tttgatgaat gtcggtttga tatcagtgtt aatgatagtg tttggtatct tcgtgctcag
300

gacccagatc acagacagca gtggatagat gccattgaac agcacaagac tgaatcagga
360

tatggatctg agtccagctt acgtagacat ggctcaatgg tgtcactggg gtctggagca
420

agtgggtact ctgctacatc cacatcttca ttcaagaaag gacacagttt acgtgagaaa
480

ttggctgaaa tggaaacttt tagagacatc ttatgtagac aagttgacac tctccaaaag
540

tactttgatg tctgtgctga tgctgtctcc aaggatgaac ttcaaaggga taaagtggta
600

gaagatgatg aagatgactt ccctacaact cgttctgatg gagacttttt gcacaatacc
660

aatggtaata aggaaaaatt atttccacat gtaaccccca aaggaattaa tggatatagac
720

tttaaagggg aagcaataac ttttaaagca actactgctg gaatccttgc tacactttct
780

cattgtattg aattaatggg aaaacgggaa gagagctggc aaaaaagaca tgataaggaa
840

atggagaaga gaagacgatt agaggaagca tacaagaatg caatggcaga gcttaagaag
900

aaaccccggtt ttggagggcc tgattatgaa gaaggtccga acagtctgat taatgaggag
960

gagttctttg atgctgttga agctgctctt gacagacaag ataaaataga ggaacagtca
1020

cagagcgaga aggtcaggtt aactggcct acacctttgc catctggaga tgccttttct
1080

tctgttgga cccatagatt tgtacaaaag ccctatagtc gctcttctc catgtcttcc
1140

attgatctag tcagtcctc tgacgatgtt cacagattca gctcccaggt tgaagagatg
1200

gtacagaacc acatgactta ctcattacag gatgtaggtg gtgatgcgaa ttggcaacta
1260

gttgtagaag aaggagaaat gaaggtatac agaagagaag tcgaagaaaa tggaattgtt
1320

ctggatcctt tgaaagctac ccatgcagtt aaaggtgtta caggacacga agtctgcaat
1380

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1440

gtggaaacat tagctgataa tgcaatcatc atttatcaaa cgcacaagag agtgtggcct
1500

gcttctcaga gagatgtact gtatctttct gctattcgaa agatcccagc cttgactgag
1560

aacgaccctg agacttgat agtttgtaat ttttctgtgg atcatgacag cgctcctctg
1620

aacaatcgat gtgtccgtgc caaatcaat gttgctatga tttgtcaaac cttagtaagc
1680

ccaccagagg gaaaccagga aataagcaga gacaacattc tgtgcaagat tacatatgta
1740

gctaattgta acccaggagg atgggcacca gcctcgggtg taagagcagt ggcaaaacga
1800

gaatatacta aatttctaaa acgttttact tcttacgtcc aagaaaaaac tgcaggaaaa
1860

ccaattttgt tt
1872

<210> 9
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<220>
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<400> 9
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22

<210> 10
<211> 27
<212> DNA
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<220>
<223> PCR primer

<400> 10
cttaagctag cttgccaaac ctacagg
27

<210> 11
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
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32

<210> 12
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56

<210> 13
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<212> DNA
<213> Artificial Sequence

<220>

<223> PCR primer

<400> 13

ggctcgagct agaacaaaat aggctttcct gc
32

<210> 14

<211> 53

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 14

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53

<210> 15

<211> 75

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 15

cagaggcact gactagatca atggaagaca tggaggaaga gcgactatag ggcttttgga
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caaattctatg tgtcc

75

<210> 16

<211> 72

<212> DNA

<213> Artificial Sequence

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<223> PCR primer

<400> 16

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60

tggtgcagaa cc
72

<210> 17
<211> 37
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37

<210> 18
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<210> 19
<211> 33
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<210> 20
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<212> DNA

<213> Artificial Sequence

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33

<210> 21

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 21

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<210> 22

<211> 38

<212> DNA

<213> Artificial Sequence

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<223> PCR primer

<400> 22

ggctcgagct aagatctagt cttgtgctgt tcaatggc
38

<210> 23

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 23

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35

<210> 24
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<212> DNA
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38

<210> 25
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<210> 26
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34

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gaagatgact tccctacaac tcgttctgat. gg
32

<210> 29
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<212> DNA
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24

<210> 30
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<400> 30
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<210> 31
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<213> Artificial Sequence

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<210> 32

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<223> PCR primer

<400> 32

ggctcgagga acaaaatagg ctttcctgc
29